



Reference No.: 41
Barite Hill/Nevada Goldfields
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C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment.

Bureau of Land and Waste Management
Division of Mining and Solid Waste Management

March 8, 2007

Ms. Sandra Harrigan
Tetra Tech EM Inc.
1955 Evergreen Boulevard
Building 200, Suite 300
Duluth, Georgia 30096

RE: Barite Hill Mine; McCormick County South Carolina
Volume Calculations for Main Pit

Dear Ms. Harrigan:

Please find enclosed a CD containing maps and spreadsheets used in determining the Main Pit volumes at Barite Hill. Also enclosed is a description as to how the volume determinations were conducted and photocopies of maps that provide references to cross-sections and an index map showing how the site was divided to facilitate the volume determinations. Hopefully, you will be able to follow, but feel free to contact me if you have any questions. My direct line is 803-896-4262 and e-mail is kennedrc@dhec.sc.gov.

Sincerely,

Craig Kennedy, P.G.
Assistant Director

cc: Tim Kadar

Volume Calculations for the Main Pit at Barite Hill

Two methods were used to determine the volume of the Barite Hill's Main Pit. The total volume of the Main Pit was determined using a contour averaging process. In determining the total pit volume, the volume of water in the pit was also determined. As a check on the contour averaging method and to determine the volume of waste rock placed in the *West Cut* and *North West Cut*, a cross section averaging method was used. The cross section method also provided a check on the water volume in the pit.

Based map used for determining volume is titled Nevada Goldfields, Inc.'s Barite Hill Mine; Main Pit w/Sulfide Backfill; Date: 3-Nov-94. This map was determined to be the latest showing the greatest extent of mining and backfilling. The base map is being provided on CD in PDF format. As the title of the map suggests, sulfide waste rock was backfilled into two mined out sections of the Main Pit toward the latter stages of mining. An 11" x 17" index map is provided to show how the Main Pit is divided.

Contour Averaging – Planimeter the area along topographic contour and multiply by interval thickness. Used 10-foot thick intervals. Base map used was mine map showing the approximate time frame when mining ended at Barite Hill, November 1994. PDF copy of the map on the Main Pit is provided on CD.

- Index map (hard copy) is provided to indicate how the pit was divided to facilitate planimetry. The Main Pit was divided into five sections, West Cut, Main Body West Cut, North West Cut, Main Body North Cut and North Cut
- Spreadsheet showing calculations of area and volume (cubic yards) of each planimetry interval.
 - Spreadsheet indicates area and volume of each contour interval.
 - Spreadsheet provides the cumulative total of each contour interval and water volume to the 420 contour.

Cross section Averaging – Cross sections were chosen at the edge of the West Cut and North West Cut and also along the long axis of the Main Pit to determine volume of water in the pit. At equal intervals, each cross sectional area was determined and an average taken over the distance of the volume being determined. This average was multiplied by the length of the cross section span (e.g., length of the North West Cut). Base map used was mine map showing the approximate time frame when mining ended at Barite Hill, November 1994.

- Copy of map showing the sections of the mine with cross sections.
- Spreadsheets showing data and calculations of cross sections and volume of waste rock in *West Cut* and *North West Cut*.

Spreadsheets and Maps on CD

Barite Hill Mine – Main Pit w/Sulfide Backfill – Date 3-Nov-94; Scale 1"=50 ft (dimension of map 24"x36")

Gwalia USA – Barite Hill – Barite Hill Project Site Plan – 15-May – 91; Scale 1"= 200ft (dimension of map 24"x36") Shows pre-mine topography

Barite Hill – Geology Plan Map w/ bar scale

Barite Hill Vol and Water Calcs – Shows volume calculations using Contour Averaging method
Barite Vol using x-sections – Shows volume calculation using cross section averaging.

Hard Copy of Maps

Map Index -- 11"x17" map of Barite Hill Mine Main Pit w/sulfide Backfill

Cross Section Map West Cut

Cross Section Map North West Cut

Cross Section Map Main Pit Water Volume in Pit

Summary of Volumes

Contour Avg.

Total Volume of Pit to approximate top rim of pit -- 1.4 million cubic yards

Total Water Volume in Pit

- Pool level 420' msl contour -- 103 million gallons (worst case)
- Pool level 415' msl contour -- 89 million gallons

Waste Rock -- not determined with this method

Cross Section Avg.

Total Volume of Pit to approximate top rim of pit -- Not determined with this method

Total Water Volume in Pit

- Pool level 420' msl contour -- Not determined with this method
- Pool level 415' msl contour -- 86 million gallons

Waste Rock

- West Cut -- 90,000 cubic yards
- North West Cut -- 87,500 cubic yards